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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,756	11/30/2000	Hideyo Makino	199892US2	1614

22850 7590 07/24/2002

OBLON SPIVAK MCCLELLAND MAIER & NEUSTADT PC
FOURTH FLOOR
1755 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202

EXAMINER

PHAM, HAI CHI

ART UNIT PAPER NUMBER

2861

DATE MAILED: 07/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant N .

09/725,756

Applicant(s)

MAKINO, HIDEYO

Examiner

Hai C Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 21-30 and 41-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 21-30 and 41-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10, 21-30, and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (U.S. 6,133,566) in view of Iwasa et al. (U.S. 6,144,685).

Yamaguchi discloses a multiple beam scanning apparatus comprising a plurality of semiconductor laser arrays as light sources (2₁-2₃, Figs. 4 and 5,) each including a plurality of light emitting points in a single package, said plurality of light emitting points being formed to be positioned in linear relationship to one another and having an equidistant pitch so as to respectively emit laser beams simultaneously scanned over a recording substrate (photosensitive drum 8,) and an adjusting means for adjusting a position of said plural semiconductor laser arrays so as to form a tilted angle θ_R , which is based on both the number of light emitting points or scanning lines (m) and the dot density (Ps) in the sub-scanning direction (col. 8, line 66 to col. 9, line 67.)

Although Yamaguchi fails to explicitly disclose the claimed relation

$$\theta \leq \tan^{-1} \{1/(n-1)\}$$

Regardless, Iwasa et al. discloses a multibeam recording apparatus in which the laser source array is arranged such that the laser beam spots on the surface of the

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recording medium are aligned (inclined line M', Fig. 7A) in the sub-scanning direction, and are inclined with respect to the main scanning direction (base line N') to form an angle θ' with the main scanning line. The disposition of the laser beam spots on the recording medium as well as the angle θ' are image of the corresponding structure of the laser source array, and result from a predetermined magnification. Table 2 (col. 11) shows the parameters of the multibeam recording apparatus in its basic configuration, where:

$$m = 30 \quad (m \text{ is the number of laser beam spots in the sub-scanning direction})$$

$$\theta = \theta' = 88.1^\circ$$

The angle formed by the line drawn perpendicular to the primary (main) scanning direction and the line drawn through respective centers of the first to the m-th laser beam spots becomes:

$$90^\circ - \theta' = 90^\circ - 88.1^\circ = 1.8^\circ$$

and the value of

$$\tan^{-1} \{1/(m-1)\} = \tan^{-1} \{1/(30-1)\} = 1.97^\circ$$

Therefore,

$$90^\circ - \theta' \leq \tan^{-1} \{1/(m-1)\}$$

which amply satisfies the claimed inequality.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Yamaguchi with the aforementioned teaching of Iwasa et al. for the purpose of adjusting the pitch of the scanning lines.

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Yamaguchi further teaches the adjusting means rotating each of the semiconductor laser arrays around a midpoint of a line connecting the centers of the light emitting points (Fig. 6,) the interval of recorded dot density in the secondary scanning direction being 50 μm at most (42.3 μm at 600 dpi to be exact) (col. 9, line 41,) and the first semiconductor laser array having an optical axis of laser beams aligned to be parallel to and tilted by a relative minute angle from that of other laser arrays so that a position of said laser beam spots on the recording substrate formed by the first laser array is adjusted to be displaced from that of beam spots from the other laser arrays by a predetermined distance along the primary scanning direction (Figs. 2b, 3a, 3b.) Yamaguchi further teaches the number of light emitting points of the laser array being 4 or higher.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John S. Hilten can be reached on (703) 308-0719. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432 for regular communications and for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read 'Hai Pham', written in a cursive style.

HAI PHAM
PRIMARY EXAMINER

July 17, 2002